

What is claimed is:

1. An engine system comprising:
 - (a) a diesel engine having a crankcase with air intake structure, blow-by vent structure, and exhaust port structure;
 - (b) a blow-by filter in gas-flow communication with said blow-by vent structure of said crankcase; and
 - (c) a diesel oxidation catalyst arrangement in gas-flow communication with said exhaust port structure.
2. A system according to claim 1 further including:
 - (a) an air filter upstream of said engine;
 - (b) a turbo downstream of said air filter and upstream of said crankcase; said turbo being in gas-flow communication with said air filter and said air intake structure of said crankcase; and
 - (i) said blow-by filter being downstream of said crankcase and upstream of said turbo;
 - (ii) said blow-by filter including a filtered gas port; said filtered gas port being upstream of and in gas flow communication with said turbo.
3. A system according to claim 2 wherein:
 - (a) said diesel oxidation catalyst arrangement comprises a catalytic converter honeycomb structure with a catalyst coating.
4. A system according to claim 3 wherein:
 - (a) said catalytic converter honeycomb structure includes a ceramic core with a catalyst comprising a metallic material.
5. A system according to claim 2 wherein:

- (a) said diesel oxidation catalyst arrangement comprises a catalytic converter honeycomb structure with a catalyst coating and sound pressure reduction structure.

6. A system according to claim 2 wherein:

- (a) said blow-by filter includes:
 - (i) a gas inlet aperture in flow communication with said blow-by vent structure of said crankcase;
 - (ii) a first stage coalescer filter oriented in extension across the gas inlet aperture and separating liquid from a gas stream;
 - (iii) a liquid flow outlet in liquid flow communication with and downstream of the first stage coalescer filter; and
 - (iv) a second stage filter in gas flow communication with and downstream of the first stage coalescer filter;
 - (A) said filtered gas port being downstream of said second stage filter.

7. A system according to claim 6 wherein:

- (a) said blow-by filter includes:
 - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;
 - (ii) the second stage filter comprises a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
 - (iii) the first stage coalescer filter is oriented in extension across the gas stream inlet aperture;

- (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter are unitary in construction;
- (v) said first stage coalescer filter includes a nonwoven fibrous bundle having a first upstream surface area; said second stage filter includes pleated media having a second upstream surface area; and
- (vi) the first upstream surface area being no more than 10% of the second upstream surface area.

8. A method for treating engine emissions comprising an engine having a crankcase; the crankcase having an air intake, a blow-by vent, and an exhaust port; the crankcase emitting blow-by gases through the blow-by vent and producing an exhaust stream through the exhaust port; the method including:

- (a) directing at least a portion of the blow-by gases through a blow-by filter to produce filtered gases;
- (b) directing the filtered gases back into the air intake of the crankcase; and
- (c) treating at least a portion of the exhaust stream with a catalyst arrangement.

9. A method according to claim 8 wherein:

- (a) the step of directing at least a portion of the crankcase gases includes directing the crankcase gases through a coalescer filter to coalesce the gases into liquid; and then, from the coalescer filter through a barrier filter to remove at least some particulate material.

10. A method according to claim 8 wherein:

- (a) the step of treating includes directing the exhaust stream through a honeycomb structure coated with a catalyst.

11. A method of reducing total emissions of a turbo-charged diesel engine having an engine crankcase and an exhaust tailpipe; the total emissions including particulate matter emissions from the engine crankcase added to the particulate matter emissions from the exhaust tailpipe; the method comprising:
 - (a) running the engine to produce crankcase blow-by gases and an exhaust stream;
 - (b) filtering the blow-by gases and directing filtered blow-by gases back into the engine crankcase; and
 - (c) treating the exhaust stream with a catalyst;
wherein the total emissions are reduced by 25% or greater when compared to the same engine that does not filter the blow-by gases and that does not treat the exhaust stream with a catalyst.
12. A method according to claim 11 wherein:
 - (a) said step of running the engine includes using low sulfur density fuel or ultra sulfur density fuel.
13. A method according to claim 11 wherein:
 - (a) said step of running the engine includes using ultra sulfur density fuel; and wherein total emissions are reduced by 25-50% when compared to the same engine that does not filter the blow-by gases and that does not treat the exhaust stream with a catalyst.
14. A method according to claim 11 wherein:
 - (a) the step of filtering the blow-by gases includes directing the blow-by gases through a coalescer filter to coalesce the gases into liquid; and then, from the coalescer filter through a barrier filter to remove at least some particulate material.
15. A method according to claim 11 wherein:

- (a) the step of treating includes directing the exhaust stream through a honeycomb structure coated with a catalyst.

16. A kit for reducing engine total emissions; the kit comprising:

- (a) a blow-by filter including:
 - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;
 - (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
 - (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
 - (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;
 - (v) said first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; said second stage filter including pleated media having a second upstream surface area; and
 - (vi) the first upstream surface area being no more than 10% of the second upstream surface area; and
- (b) a catalytic converter muffler comprising a catalytic converter honeycomb structure with a catalyst coating and sound pressure reduction structure.

17. In a system having a turbo-charged diesel engine having an engine crankcase with blow-by vent structure and exhaust port structure, a method comprising:

- (a) installing a blow-by filter in gas-flow communication with the engine crankcase blow-by vent structure; and

(b) installing a catalytic converter muffler arrangement comprising a catalytic converter honeycomb structure with a catalyst coating in gas-flow communication with the engine crankcase exhaust port structure.

18. A method according to claim 17 wherein:

- (a) said step of installing a blow-by filter includes installing a blow-by filter including:
 - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;
 - (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
 - (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
 - (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;
 - (v) the first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; the second stage filter including pleated media having a second upstream surface area; and
 - (vi) the first upstream surface area being no more than 10% of the second upstream surface area.